

## PATENT ABSTRACTS OF JAPAN

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(54) FILM AND PACKAGE FOR PACKAGING FRUIT AND VEGETABLES

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a film and package which have a sufficient anti-fogging property and transparency and are suitable for packaging perishables.

SOLUTION: The package film comprises a base layer formed by biaxially stretching a polypropylene resin as the main element, and a multilayer laminate having a seal layer constituted mainly of a polyolefin resin formed on the inside surface of the base layer. The seal layer forming the inside surface of the base layer is constituted of the polyolefin resin as the main element with swell ratio of 1.10 to 1.40, and has an antifogging surface. The base layer is constituted of the polyolefin resin as the main element, which contains an antifogging agent and has a swell ratio higher than the one of the polyolefin resin formed on the inside surface of the base layer and of 1.42 or lower.

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CLAIMS

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[Claim(s)]

[Claim 1]A substratum which makes a polypropylene resin a subject and comes to carry out biaxial extension.

A sealing layer which makes a subject polyolefin system resin formed in an inner surface of a substratum.

A sealing layer which is the film for a package provided with the above, and forms an inner surface of a substratum, A swell ratio makes a subject polyolefin system resin of the range of 1.10-1.40, and the surface has fog resistance, and b substratum, An antifogger exists in resin to constitute and it becomes considering polyolefin system resin which is larger than a swell ratio of polyolefin system resin of a sealing layer formed in an inner surface of a substratum, and has 1.42 or less swell ratio as a subject.

[Claim 2]The film for a package according to claim 1, wherein an antifogger exists in total layers.

[Claim 3]The film for a package according to claim 1 or 2 characterized by coming to carry out biaxial extension.

[Claim 4]The film for a package according to claim 1, 2, or 3 using for a fresh article package.

[Claim 5]A packed body which uses the film for a package according to claim 1, 2, 3, or 4, and is characterized by things.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]Especially this invention about the film for a package, and a packed body Vegetables and root vegetables, fruits, It is related with the film and packed body which become an inner surface suitable for packing the fresh article (these are hereafter called a fresh article on these specifications) which consists of the vegetation or animals as which high freshness, such as a flower, flowering trees and shrubs, mushrooms, a fish, and meat, is required from the multilayer layered product which has a sealing layer.

[0002]

[Description of the Prior Art]From the former, since an optical property, mechanical properties, packaging aptitude, etc. are excellent, the polypropylene system film is widely used for packaging fields, such as food packing and a textiles package. Especially the antifog film is widely used for the package of vegetables etc.

[0003]

[Problem(s) to be Solved by the Invention]Conventionally, with the publicly known antifog film, in order to maintain fog resistance stability and for a long period of time, techniques, such as scouring an antifogger to the resin which constitutes a film and being crowded to it, have been taken. However, these antifoggers scour and in full resin. When carrying out melt extruding of this and forming a film, the phenomenon of the antifogger sublimated from the extrusion opening of melting resin having blown off, and if the worst happens saying adhesion with the taking over roll of melting resin and melting resin started, as a result, crystal growth of resin was promoted, and there were problems, such as worsening transparency.

[0004]This invention solves the problem of a ~~polypropylene oriented film~~ of having the above-mentioned conventional fog resistance, and an object of this invention is to provide a film and a packed body suitable for packing the fresh article which has sufficient fog resistance and

transparency.

[0005]

[Means for Solving the Problem]In order to attain the above-mentioned purpose, a film for a package of this invention, 1. It is a film for a package which consists of a multilayer layered product which has a substratum which makes a polypropylene resin a subject and comes to carry out biaxial extension, and a sealing layer which makes a subject polyolefin system resin formed in an inner surface of a substratum, a) As for a sealing layer for which an inner surface of a substratum is formed, a swell ratio makes a subject polyolefin system resin of the range of 1.10-1.40, and the surface has fog resistance, and b) substratum, It is larger than a swell ratio of polyolefin system resin of a sealing layer which an antifogger existed in resin to constitute and was formed in an inner surface of a substratum, A film for a package becoming considering polyolefin system resin with 1.42 or less swell ratio as a subject, 2. Film for package of one above-mentioned statement, wherein antifogger exists in total layers, a packed body which uses a film for a package the above 1 and 2 using for the above 1 characterized by coming to carry out 3.2 axis extension or a film for a package of 2, and 4. fresh article package or a film for a package given in 3, 5. above 1, 2, and 3, or given in 4, and is characterized by things, \*\* et al. -- so-called -- it is .

[0006]

[Embodiment of the Invention]Hereafter, the embodiment of the film for a package of this invention and a packed body is described. The film for a package used in this invention is a film for a package which consists of a multilayer layered product which has a substratum which makes a polypropylene resin a subject and comes to carry out biaxial extension, and a sealing layer which makes a subject the polyolefin system resin formed in the inner surface of a substratum.

[0007]As for such a film for a package, manufacturing with a coextrusion process etc. is preferred. Although biaxial extension of the substratum of the film for a package which constitutes this invention needs to be carried out, the sealing layer formed in an inner surface may be in which state of un-extending, 1 axis extension, and biaxial extension.

[0008]As a polypropylene resin suitable for forming the substratum of the film for a package in this invention here, it is larger than the swell ratio of polyolefin system resin of the sealing layer formed in the inner surface, and it necessary to have 1.42 or less swell ratio. A swell ratio means the major component of the size of a die swell (what shows the flow state of melting resin in an extruding-die exit), it means here that expansion at an extruding-die exit is so large that this value is large, and resistance is strong. It means that expansion at an extruding-die exit is small if small, and resistance is small.

[0009]Under the present circumstances, in below the swell ratio of the polyolefin system resin of a sealing layer in which the swell ratio of the polypropylene resin which forms a substratum

was formed in the inner surface, Since the pressure of the sublimated antifogger and sealing layer resin turns to the substratum side when resin is extruded from an extruder exit, Since the pressure in an extruder exit is outside suitable too much when contact with a taking over machine becomes unstable, spots are made to crystallization of resin, transparency is worsened and a swell ratio exceeds 1.42, at an extruder exit, \*\*\*\* of the sealing layer resin surface and metal arises, and appearance is worsened.

[0010]As mentioned above, as a polypropylene resin suitable for forming a substratum, It is not what will be limited especially if a mentioned range is satisfied. For example, one sort, such as a propylene butene-1 copolymer, a propylene ethylene butene-1 copolymer, a propylene ethylenic copolymer, and a propylene pentene copolymer besides isotactic polypropylene, or two sorts or more are used. Polyolefin system resin, for example, the ethylene butene-1 copolymer, of further others, The ionomer which constructed the bridge with the metal ion in the ethylene propylene butene-1 copolymer, and an ethylene acrylic acid copolymer and an ethylene acrylic acid copolymer, The polybutene 1, a butene ethylenic copolymer, etc. may be used in part, and polyester system resin, polyamide system resin, polycarbonate system resin, etc. can also be further used in the range which does not injure the characteristic of a film. An ultraviolet ray absorbent, an antioxidant, etc. can also be blended arbitrarily.

[0011]As polyolefin system resin suitable for forming the sealing layer of the inner surface of the film for a package in this invention, the ranges of a swell ratio need to be 1.10-1.40. When a swell ratio is less than 1.10, here, It is pushed on the pressure of the sublimated antifogger when resin is extruded from an extruder exit, Since the pressure in an extruder exit is outside suitable too much when contact with a taking over machine becomes unstable, spots are made to crystallization of resin, transparency is worsened and a swell ratio exceeds 1.40, at an extruder exit, \*\*\*\* of the sealing layer resin surface and metal arises, and appearance is worsened.

[0012]As mentioned above, as a polypropylene resin suitable for forming a sealing layer, It is not what will be limited especially if a mentioned range is satisfied. For example, an ethylene butene-1 copolymer, an ethylene propylene butene-1 copolymer, The ionomer which constructed the bridge with the metal ion in the ethylene acrylic acid copolymer and the ethylene acrylic acid copolymer, Although one sort, such as polypropylene, the polybutene 1, a butene ethylenic copolymer, a propylene propylene butene-1 copolymer, and a propylene pentene copolymer, or two sorts or more are used, Furthermore, polyester system resin, polyamide system resin, poly car bow NETO system resin, etc. can also be used in the range which does not injure the characteristic of a film. It is preferred to contain suitably the particles which consist of inorganic particulates or organic polymer.

[0013]The film for a package of this invention requires that the sealing layer surface should have fog resistance, and, for this reason, usually, an antifogger exists in the resin which

constitutes a substratum and a sealing layer. At the time of film manufacture, an antifogger may be blended with both resin which forms the resin which forms a substratum, and a sealing layer, the antifogger is blended only with the resin which forms a substratum, and a film may be manufactured. Even if it is a case of the latter, the antifogger in the resin which forms a substratum at the time of film manufacture and the storage after film formation shifts to a sealing layer one by one, and will be in the state where bleed out is carried out subsequently to the sealing layer surface, and the sealing layer surface has fog resistance.

[0014]An antifogger where a fresh article is packed, as shows the fog resistance in a preservation thru/or circulation term question must exist in the sealing layer surface of the side which touches the fresh article in this film for a package. Namely, in this invention, prevent the cloudy phenomenon of a packed body inner surface, and it not only raises commodity value, but, Also when preventing water corrosion of the packed body contents by the waterdrop formed by cloudy advance, an antifog operation is the very important characteristic, and in order to make the fog resistance which was excellent in the target according to the distribution process over a long period of time maintain, preservation thru/or the atmospheric temperature change at the time of circulation are taken into consideration, An antifogger as continues during the progress which repeats a temperature change with a 5-30 °C question and shows fog resistance is wanted to be what exists in the sealing layer surface.

[0015]After harvest makes applicable to a package the fresh article which maintains a physiological function, and, as for this invention, it is more preferred than frozen storage to set in setting out of the antifog characteristic in this invention from the place where preservation in room temperature atmosphere is desired rather with fog resistance when a temperature change is repeated with a 5-30 °C question.

[0016]As an antifogger used, the fatty acid ester of polyhydric alcohol, the amines of higher fatty acid, AMAIDO of higher fatty acid, amine of higher fatty acid, the ethyleneoxide addition of AMAIDO, etc. can be mentioned as a typical thing, for example. As for especially the abundance in the inside of the film of this antifogger, 0.2 to 5 % of the weight is preferred 0.1 to 10% of the weight at total-layers conversion, and it is preferred especially in a sealing layer constituent that it is 0.1 to 1.0 % of the weight 5 or less % of the weight.

[0017]Although the thickness ratio in particular of a sealing layer does not limit, it is usually 1 / 50 - 1/3 (when it has a sealing layer to both sides of a substratum, it is the sum total thickness) to the total layers in the film for a package of this invention. If a thickness ratio is smaller, it will become insufficient [ seal strength ], and the reliability as a packed body will be missing. The shape of the packed body after the waist will be lost on the whole film for a package according to the rate of a substratum portion being small if a thickness ratio is larger, and being filled up with a fresh article is unstable, and commodity value is missing. Although the thickness in particular of the film for a package is not limited, it is about 5-250 micrometers, and the

thickness of a sealing layer can be suitably defined in this range.

[0018]The measuring method of weighted solidity used into this specification is described below.

(1) In the major company of the size of a swell ratio die swell, expansion at an extrusion opening exit is so large that it is large. A photograph of the melting resin discharge part at the time of measuring the melt flow rate based on the polypropylene test method (230 \*\*, 21.18N) shown in JIS K6758 was taken, and the ratio of a die inside diameter to the diameter of a melting resin strand extruded from a die was measured (figure-1 reference). Swell ratio = the diameter of a melting resin strand / die inside diameter [0019](2) Transparency (%)

Hayes was measured based on JIS K7105.

[0020](3) Put 300 cc of 50 \*\* warm water into a fog resistance \*\*500cc upper opening container.

\*\* Carry out the fog resistance measuring plane of a film inside, and seal a container opening with a film.

\*\* Neglect it all over [ of 5 \*\* ] a cold room.

\*\* Move to a 5 \*\* cold room after neglect 12:00 question at the environment of 30 \*\*, and neglect it for 12 hours.

After repeating operation of \*\*\*\* for two days, the Russian adhesion condition of a film measuring plane is evaluated in six steps.

The 5th class of whole-surface dew-less (adhesion area O) evaluation [ : with an evaluation of the class / 6th ]: Some Russian adhesion (to the adhesion area 1/5.) some : with an evaluation of the class [ 4th ] Russian adhesion (up to adhesion area 1/4) evaluation [ the 3rd class of ]: -- about -- one half of 2nd [ Russian adhesion (up to adhesion area 2/4) evaluation ] class: -- almost -- 1st [ Russian adhesion (up to adhesion area 3/4) evaluation ] class: -- whole surface Russian adhesion (3/4 or more adhesion area) [0021]

[Example]Hereafter, although an example explains this invention concretely, this invention is not limited to the following examples.

[0022](Example 1) the resin \*\* propylene ethylene butene copolymer for (1) sealing-layer formation (ethylene content % of 2.5 mol.) Butene content 7 Mol %, swell ratio 1.24 100 weight section, Inactive particle (SAIRISHIA 430, product [ made from Fuji SHIRISHIA Chemicals ], particle diameter of 2.5 micrometers) 0.25 weight section and antifogger (higher-fatty-acid ester mono-glycerite) 0.45 weight-section % were mixed, and it was considered as resin for sealing layer formation.

[0023](2) The antifogger (higher-fatty-acid ester mono- glycerite) 1.0 weight section was mixed to resin \*\* isotactic polypropylene polymer (swell ratio 1.31) 100 weight section for substratum formation, and it was considered as resin for substratum formation.

[0024](3) At a rate of 1:9 (weight ratio), as it becomes the resin temperature of 260 \*\*, fuse

resin of film production \*\*, and resin of \*\*, and a co-extrusion is carried out from a T die by three layer states which laminated the sealing layer to both sides of the substratum, It extended 9 or 5 times in the transverse direction further 4 times to the lengthwise direction after casting in the KYASUTIN crawl with a temperature of 25 \*\*.

[0025]Subsequently, corona discharge treatment is performed on the sealing layer surface of the obtained film, a corona-discharge-treatment side gets wet, and they are tension 39 mN/m, 18 micrometers of substrata, and sealing layer one side. A total of the 1-micrometer film [ 20-micrometer ] for a package of three layers was obtained.

[0026]The various characteristics of the obtained film for a package are shown in Table 1. It combines and has the fog resistance which was excellent as shown in this table, and transparency.

[0027](Comparative example 1, 2) In Example 1, the swell ratio of the resin used for a sealing layer and a substratum was changed as shown in Table 1, respectively, and the film of the comparative examples 1 and 2 was obtained. The various characteristics of the obtained film for a package are shown in Table 1.

[0028]The comparative example 1 is inferior to transparency in the swell ratio of a sealing layer more highly than that of a substratum.

[0029]Since the comparative example 2 exceeded the range of predetermined in the swell ratio of a substratum, transparency worsens.

[0030](Comparative example 3) In the comparative example 1, the film for a package was obtained like Example 1 except not blending an antifogger with a sealing layer and each substratum.

[0031]The various characteristics of the obtained film for a package are shown in Table 1. The fog resistance of a good thing is remarkable and the transparency of the fog resistance is bad.

[0032]

[Table 1]

	スウェル比		ヘイズ	防曇性
	基層	シール層		
実施例 1	1.31	1.24	1.8	6
比較例 1	1.31	1.47	2.8	6
比較例 2	1.44	1.24	2.5	6
比較例 3	1.31	1.47	1.5	1

[0033]

[Effect of the Invention]While having the fog resistance outstanding in the package of a fresh article according to the film for a package and packed body of this invention, the film for a package with the outstanding transparency can be provided.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]Swell ratio = the figure showing the diameter of a melting resin strand / die inside diameter

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